

## **APPENDIX A**

### **SITE-SPECIFIC DATA QUALITY OBJECTIVES**

**Appendix A**  
**Site-Specific Data Quality Objective**  
**ITC**  
**Media of Concern – Surface Water**

<b>STEP 1. STATE THE PROBLEM</b>	
<p>ITC is an operational chemical facility involved in an incident which involves an uncontrolled fire involving a series of above ground storage tanks containing various gasoline constituents including naphtha, xylene, and toluene. The documented contaminants of concern (COCs) include Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Oil and Grease (O&amp;G), Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) and the resulting chemical oxygen demand (COD) in water. Surface water samples will be collected from on-site locations to determine the nature and extent of site-related contamination. Samples will be collected from areas that may be affected by ITC product runoff and/or fire suppression water. Sample locations will be approved/determined by EPA prior to sample collection. Analytical results will be compared to background concentrations and EPA Regional Screening Levels (RSLs).</p>	
<b>STEP 2. IDENTIFY THE DECISION</b>	
Are the concentrations of COCs in surface water, represented by a sample, above specified action levels?	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	<ul style="list-style-type: none"> <li>• If any contaminant exceeds the specified action levels or screening levels in surface water, the surface water represented by that sample will be considered contaminated and will require additional attention.</li> <li>• If no contaminants exceed the specified action levels or screening levels in surface water, the surface water represented by that sample will not require additional attention.</li> </ul>
<b>STEP 3. IDENTIFY INPUTS TO THE DECISION</b>	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	<ul style="list-style-type: none"> <li>• Concentrations of contaminants in surface water samples collected during sampling.</li> </ul>
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	<ul style="list-style-type: none"> <li>• Surface water samples will be collected daily from four locations in and around Buffalo Bayou.</li> <li>• Analytical results obtained from the laboratory following SW-846 Methods 8260B (VOCs), 8270D (SVOCs), and EPA Methods 537M (PFOS/PFOA), 1664 (O&amp;G), and SM5220-D/410.4 (COD).</li> </ul>
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	Analytical results will be compared to background concentrations and EPA RSL concentrations.
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	Surface water sampling techniques are described in the Quality Assurance Sampling Plan (QASP). The analytical methods to be performed on samples are as follows: SW-846 Methods 8260B (VOCs), 8270D (SVOCs), and EPA Methods 537M (PFOS/PFOA), 1664 (O&G), and SM5220-D/410.4 (COD).

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<b>STEP 4. DEFINE THE BOUNDARIES OF THE STUDY</b>	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	The study area which includes Buffalo Bayou, and the Houston Ship Channel as illustrated in Figure 2-2 (Site Layout Map).
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentrations in surface water.
DEFINE THE SCALE OF DECISION MAKING.	The scale of decision will be for surface water represented by each sample collected from the study area.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The data will apply until the surface water represented by the sample receives appropriate response actions.
DETERMINE WHEN TO COLLECT DATA.	Samples will be collected during the ER in March 2019.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	<ul style="list-style-type: none"> <li>• Inclement weather.</li> <li>• Site access not attainable.</li> <li>• Access to surface water sample location not obtainable.</li> </ul>
<b>STEP 5. DEVELOP A DECISION RULE</b>	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	ER surface water samples will be compared to the site action levels.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	Analytical results will be compared to background concentrations and EPA RSLs.
DEVELOP A DECISION RULE.	If any result in a surface water sample is above the site-specific action level, then the surface water represented by that sample will require additional attention; otherwise, the surface water does not require additional attention.

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<b>STEP 6. SPECIFY LIMITS ON DECISION ERRORS</b>	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from 0 mg/L to more than the site-specific action level.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<p><u>Type I Error</u>: Deciding that the specified area represented by the surface water sample does not exceed the specified action level when, in truth, the surface water concentration of the contaminant exceeds its specified action level. The consequence of this decision error is that contaminated surface water will remain on-site, possibly endangering human health and the environment. There may also be potential future liability associated with clean-up costs of leaving contaminated surface water on-site. This decision error is more severe.</p> <p><u>Type II Error</u>: Deciding that the specified area represented by the surface water sample does exceed the specified action level when, in truth, it does not. The consequences of this decision error are that remediation of the specified area will continue and unnecessary costs will be incurred.</p>
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	<p>The true state of nature when the surface water is decided to be below the specified action levels when in fact, it is not below the specified action levels, is that the area may need remedial action.</p> <p>The true state of nature when the surface water is decided to be above the specified action levels when in fact, it is not above the specified action levels, is that the area may not need remedial action.</p>
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS ( $H_0$ ) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS ( $H_a$ ).	<p><math>H_0</math>: The surface water represented by the surface water sample of the specified area is above the specified action level.</p> <p><math>H_a</math>: The surface water represented by the surface water sample of the specified area is below the specified action level.</p>
ASSIGN THE TERMS “FALSE POSITIVE” AND “FALSE NEGATIVE” TO THE PROPER DECISION ERRORS.	<ul style="list-style-type: none"> <li>False Positive Error = Type I</li> <li>False Negative Error = Type II</li> </ul>
ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.	The assignment of probability values is not applicable to this DQO because a non-probabilistic (judgement-based) process has been specified.

STEP 7. OPTIMIZE THE DESIGN	
<i>REVIEW THE DQO</i>	Due to insufficient historical data, determination of the standard deviation was not possible. Therefore, sample size calculation using the traditional statistical formula may not be the optimal design. In order to select the optimal sampling program that satisfies the DQOs and is the most resource effective, other elements were considered.
<b>DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN.</b> Five daily surface water samples (including QA/QC samples) will be collected from locations to be determined in and around Buffalo Bayou and the Houston Ship Channel. The samples will be analyzed for SW-846 Methods 8260B (VOCs), 8270D (SVOCs), and EPA Methods. 537M (PFOS/PFOA), 1664 (O&G), and SM5220-D/410.4 (COD). Samples will be collected utilizing sampling procedures described in Section 3.0 of the QASP. A 1-2 rush day turnaround time (TAT) has been requested for the samples as part of the ER.	